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BIOLOGICAL EVALUATION OF RED PINE PLANTATION DETERIORATION ON THE HURON NATIONAL FOREST

1966

By Imants Millers, Entomologist

A. INTRODUCTION

An unusual red pine plantation deterioration problem first appeared in 1965, and assumed epiphytotic proportions in 1966. The small red pines, less than 10 years old, show branch and stem mortality associated with bark lesions. The causal agent is not known, but the more than 14,000 acres of known affected plantations make it imperative that the cause is determined and preventive methods instituted. The following action is recommended:

1. Intensive evaluation of the problem.
2. Determine cause of the mortality.
3. Re-evaluate reforestat on program to prevent further losses.

B. TECHNICAL INFORMATION

1. Causal Agent

UNKNOWN

2. Host Trees

Red Pine, Pinus resinosa Ait.
Jack Pine, Pinus banksiana Lamb.

3. Type of Damage

The first indication of the malady is flagging of branches. Usually one or more branches turn off-color from light green to red and final loss of needles. Closer examination reveals a lesion or a canker on the branch or on the main stem. Eventually the whole tree dies.

4. Epipytology

Entomological search for cause of the deterioration indicates that insects are not involved. An Eriophyiid mite, species unknown, is abundant on the red pine foliage, but its effects are not known. Search for pathogens has yielded negative results. According to Skilling and Cordell, Scleroderris does not appear to be involved. Environmental factors may be involved. The last two growing seasons experienced very dry months in May and June when shoot elongation occur However, the flagging type of damage is not characteristic of drouth damage trees. Drouth is not likely to produce lesions or cankers. Eiche (1966) describes very similar lesions as basal stem girdle of Scotch pine at Norrland, Sweden. Apparently, the lesions are caused by thawing and freezing in January and February. This is a possibility, since last two winters have been unusual for lack of snow and unseasonal warm days in January. However, the weather was similar on both Huron

and Manistee National Forests, yet mortality is observed only on the former. Thus, none of the logical explanations seem to fit our conditions.

The symptomatology of the problem is very similar to that described by Eiche (1966). The major observed conditions and symptoms are as follows:

a. Damage occurs primarily in open field plantations. Any type of overstory appears to protect the trees.

b. Flagging trees usually exhibit some type of lesion on the branch. These lesions appear to be the result of dead inner bark, cambium and phloem.

c. The lesions kill or girdle the branch or stem rapidly.

d. The lesions, flagging, and tree mortality appeared suddenly in the last two years. Old cankers were not observed, but more intensive search may be fruitful.

5. Location and Extent of Outbreak

The greatest mortality from this unknown girdling occurs on the Mio R.D. About 12,000 acres of red pine are varying degrees of decline, and much of it has less than 50% trees that would survive if the condition would not spread. Harrisville R.D. has about 3,500 acres of red pine plantation in similar condition. Generally, trees less than few years old and in open areas are most severely affected. The attached map shows areas where the flagging is known to occur from air and ground observations. Additional information will be available when Scleroderris survey data is analyzed.

C. DISCUSSION AND RECOMMENDATION

The red pine plantation deterioration is a severe problem and is considered a threat to the future reforestation programs. The cause of the tree mortality is not known. Commonly known insects and diseases do not appear to be involved. An unidentified Eriophyiid mite is associated with the problem. Fluctuating winter temperatures and drouth may contribute to the problem. The severity of the problem requires intensive study to determine causal agents and methods of loss prevention. The following action is recommended:

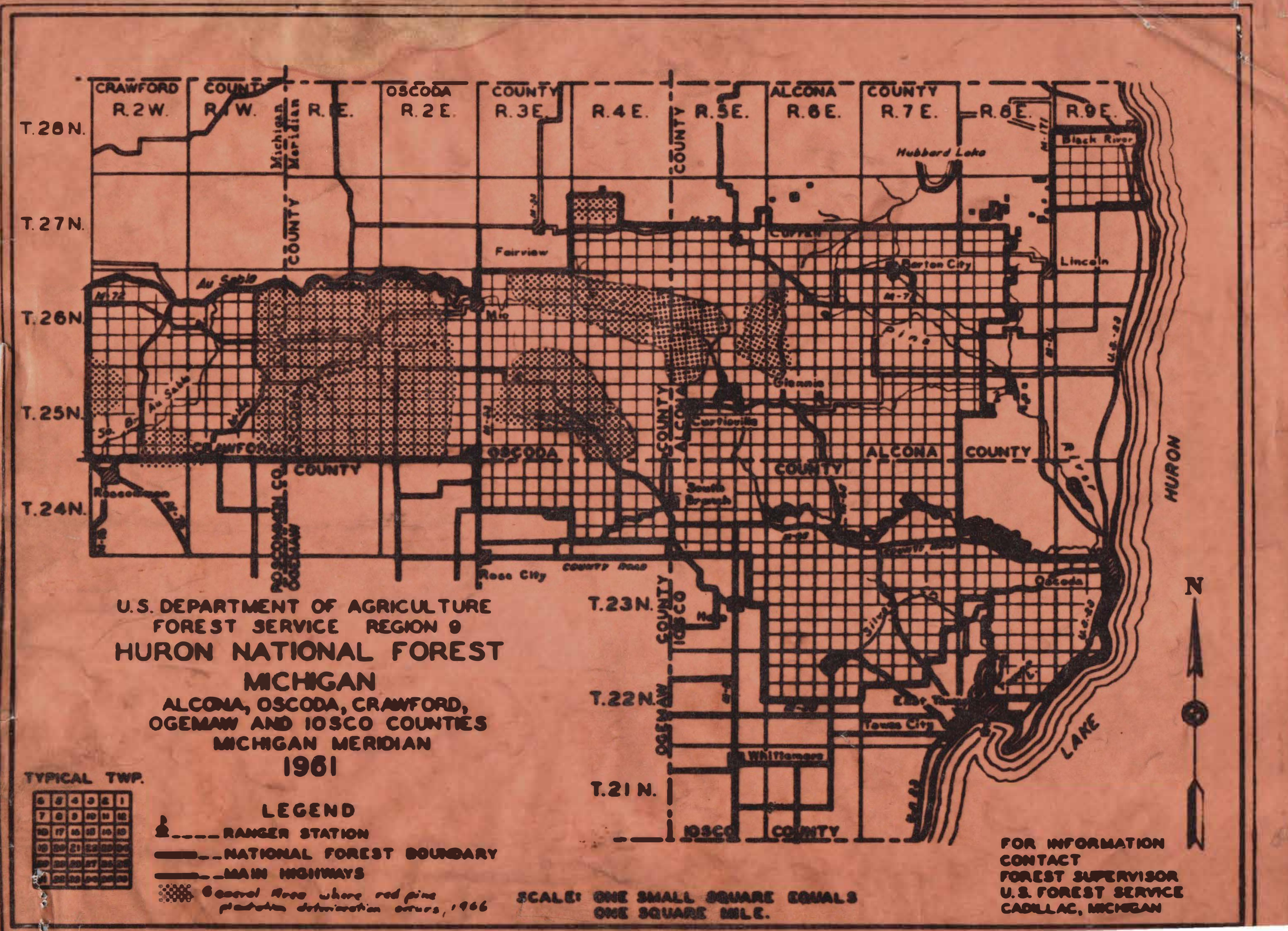
1. Intensive evaluation of the problem in 1967.
   a. Distribution
   b. Species affected.
   c. Age limits.
   d. Local conditions that favor or prevent mortality.

2. Determine likely causes. Perhaps this should be a research study.

3. Re-evaluate reforestation program in the light of acquired knowledge of the deterioration problem.

D. CITED REFERENCES

EICHE, V., 1966. Cold Damage and Plant Mortality in Experimental Provenance Plantations with Scots Pine in Northern Sweden. Skogshögskolan. Stockholm 219 pgs.



U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE REGION 9
HURON NATIONAL FOREST
MICHIGAN
ALCONA, OSCODA, CRAWFORD,
OGEMAW AND IOSCO COUNTIES
MICHIGAN MERIDIAN
1961
CRAWFORD COUNTY
OSCODA COUNTY
ALCONA COUNTY
OGEMAW COUNTY
IOSCO COUNTY
ROSCOMMON CO.
R.2W.
R.1W.
R.1E.
R.2E.
R.3E.
R.4E.
R.5E.
R.6E.
R.7E.
R.8E.
R.9E.
T.28N.
T.27N.
T.26N.
T.25N.
T.24N.
T.23N.
T.22N.
T.21N.
Michigan Meridian
Hubbard Lake
Black River
Fairview
Au Sable
Mio
Lincoln
Barton City
Glennie
Curtisville
South Branch
Rose City
COUNTY ROAD
Oscoda
East Tawas
Tawas City
Whittemore
Hale
LAKE HURON
N
TYPICAL TWP.
LEGEND
RANGER STATION
NATIONAL FOREST BOUNDARY
MAIN HIGHWAYS
General Area where red pine plantation deterioration occurs, 1966
SCALE: ONE SMALL SQUARE EQUALS ONE SQUARE MILE.
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